Saskatchewan Agriculture and Food

FINAL REPORT

BEEF DEVELOPMENT FUND

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DELIVERY OF ON-FARM QUALITY ASSURANCE TO SASKATCHEWAN PRODUCERS

Funded by
The Beef Development Fund

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Prepared by: The Saskatchewan Quality Starts Here Working Group
C/o Saskatchewan Cattle Feeders Association

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The Saskatchewan Quality Starts Here Working Group C/o Saskatchewan Cattle Feeders Association

Final Report to Saskatchewan Beef Development Fund Board Project 20010122 RES:B049

A. Abstract/Summary

The objective of the project was to secure a Provincial Beef On-Farm Food Safety Coordinator to implement the Quality Starts Here program for Saskatchewan beef producers, with a possibility of joining other commodities as they develop and deliver their on-farm food safety programs.

Food safety is a main priority for the beef industry; the Quality Starts Here program is a framework within which producers can address consumers' concerns about the safe production of beef products. Quality Starts Here is a HACCP-based program; HACCP is an internationally recognized standard for food safety. Canada is recognized as a world leader in beef production; the Quality Starts Here program is one of the first beef on-farm food safety programs in the world and its implementation will continue to keep our high quality beef products in the forefront worldwide. Quality Starts Here focuses on management practices that producers will easily implement in their operations on a daily basis to address food safety and quality issues; many of these management practices are already being followed by beef producers.

Funding was obtained from SBDF and CARDS to hire a skilled coordinator to deliver the program while collaborating with Canadian Cattlemen's Association to develop criteria for delivery of the program in Saskatchewan as well as to develop national standards. The Canadian Cattlemen's Association developed some of the tools and direction for the program; the Coordinator began development of the infrastructure to deliver the program within Saskatchewan. The Provincial Coordinator's tasks were to increase producer awareness of the Quality Starts Here program, to launch pilot projects and trial audits of these pilots within Saskatchewan's beef industry, and to work together with other provincial organizations toward the formation of a provincial multi-commodity delivery structure.

B. Technical Report

Saskatchewan Quality Starts Here Working Group hired a coordinator to begin delivery of the Quality Starts Here in April 1, 2002. Dr. Ted Dupmeier implemented accreditation pilot programs within Saskatchewan; due to time constraints with his veterinary practice he resigned in October, 2002. Dave Long was hired as the Provincial Coordinator in December, 2002. He contacted the pilot projects that had been initiated by Dr. Dupmeier as well as to introduce many other producers to the program. At the end of the project there were over 20 producers who had enrolled as pilots on the program; as well several hundred producers throughout the province attended meetings to introduce them to the Quality Starts Here program.

Our Provincial Coordinator also traveled to industry conventions held by Saskatchewan Stock Growers and Saskatchewan Cattle Feeders, as well as field days conducted by producer clubs. He also held meetings with SARM and Provincial Pastures to increase involvement of producers within the province. Information on the program has also been submitted to the Stockgrower Magazine and Rural Councillor.

Dave Long made several trips to Calgary for meetings with provincial and national counterparts to continue development of the Quality Starts Here program. Meetings included provincial coordinators meetings, as well as representation on the National Management, Technical and Communications committees. Saskatchewan representation on these committees was extremely important as only two other provinces (Alberta and Ontario) have developed a Provincial Delivery Agency and have pilot projects ongoing at this time. These three provinces are crucial in the information gathering process to determine what will be the most practical, cost-effective and timely way to deliver this program to beef producers in Canada. Our Provincial Coordinator provided input into program direction and development of materials required for national program delivery.

The Coordinator collected data with regard to delivery costs so that an economic analysis can be completed to determine final delivery costs to producers in terms of time and financial commitment.

A Saskatchewan multi-commodity committee representing beef, dairy, sheep, bison, herbs and spice, and pork producers was developed to investigate possible synergies that might exist in development and delivery infrastructure amongst these species within Saskatchewan. Our Provincial Coordinator represented Quality Starts Here on this committee to investigate the feasibility of a multi-commodity delivery agency within Saskatchewan.

EMS Croscan was hired to determine parameters for certification and auditing required by on-farm food safety programs. They are an organization familiar with HACCP and ISO principles – the Quality Starts Here Verified Beef Production program is designed to be a HACCP and ISO based program. They developed possible scenarios that could be applied to a multi-commodity on-farm food safety certification system in Saskatchewan including an outline of the operational framework, management system and audit program that would benefit a multi-commodity delivery agency.

In March, 2003 twenty-two people representing eight different commodities (beef, bison, pork, herb and spice, grains and oilseeds, broiler chickens, fruit and sheep) took the On-Farm Food Safety Auditor Training Course developed by Canadian Federation of Agriculture and COFFS and delivered by SGS Canada.

In February, 2004 eleven persons who had previously successfully passed the COFFS 5-day course received the Beef Auditor training. The training was delivered by Dan Ferguson and Paul Stiles who are Ontario's Provincial Coordinators. All persons present successfully passed the two-day course.

A Biosecurity Protocol for On-Farm Food Safety Auditors was submitted to the Working Group in December, 2003 by Janice Sopatyk, a veterinarian active in the QSH/CCIA AIMS Speakers' Bureau. This protocol outlines procedures to be followed by on-farm auditors in order to not compromise biosecurity on the farm of the producer being audited or on the home farm of the person conducting the audit. (copy enclosed)

Our Provincial Coordinator assisted in the development of QSH communications tools such as calendars and calving booklets. He also developed sample materials for producer training including producer manuals, records and protocols. These materials were also brought forward to the National committee in an attempt to develop a nationally consistent program.

Even with the shadow of BSE over the industry, we continue to experience interest in the program and our Provincial Coordinator remains actively involved delivering the program to beef producers in Saskatchewan

D. Equipment

The Saskatchewan QSH Working Group did not purchase or rent any equipment as a result of this project.

E. Acknowledgment

We greatly appreciate the support of the BDF Board for this project. This support is acknowledged during the many presentations, seminars and workshops conducted by our Provincial Coordinator.

BIOSECURITY PROTOCOL FOR ON-FARM LIVESTOCK AUDITORS

With an increasingly global marketplace and mounting pressure on livestock producers to minimize antimicrobial use in food-producing animals, biosecurity becomes an increasingly more important component of an integrated production-management program. A biosecurity plan is one of the least expensive yet most effective means of disease control and no disease prevention program will work without it. (16) A producer's biosecurity program is his most cost-effective yet pro-active way to minimize the threat of disease. (7) A biosecurity program is like an insurance policy for the health and productivity of the herd and the credibility and validity of the Quality Assurance program.

The goal of biosecurity is to stop transmission of disease causing agents and involves management principles used to prevent infectious agents from entering a livestock operation. (4) Biocontainment is the effort to contain the spread of disease within the herd and/or from leaving the premises. The On-Farm Livestock Auditor must follow principles of biosecurity and biocontainment in order not to compromise the biosecurity program of the producer or the principles of the Quality Assurance program he is reviewing. (10)

Auditing will be done mainly by people who will be considered high-risk by virtue of being livestock producers at home and by auditing several species of livestock on different premises. (23) Potential for liability exists should disease transfer occur between audited operations or from/to a home operation. This risk can be managed by implementing sound biosecurity principles for auditors to follow. (24) The auditor's biosecurity protocol is based on the principles of isolation, traffic patterns and sanitation.

Isolation principles for auditors centre around minimizing contact between different groups of animals on one operation and preventing the introduction of disease agents onto the property. (17) For example, auditors could act as mechanical carriers of disease on their clothing and boots. Some of these diseases are zoonoses (diseases transmissible between animals and humans) posing public health and occupational health concerns. There may be other species present on the operation and the auditor must consider disease transfer between species on the operation and to/from other operations even though the audit may involve only one species.

Traffic patterns must be considered – it is best to start with the least disease resistant and highest health status group and work toward the group with the lowest health status. Auditors must be cognizant of the potential to spread disease agents to the most susceptible group or species of animals on the operation. It is also important to consider the species present and their disease interaction. (18,19) Even though some producers may not be particularly concerned with traffic patterns the auditor should demonstrate leadership and conduct an audit in such a way as to minimize disease transfer.

Many common pathogens are spread by fecal contact. The main objective of sanitation is to prevent fecal contamination from entering the oral cavity of animals. (1) Disease is also spread by aerosol transmission or presence of a variety of body fluids. The goal of biosecurity is to prevent these disease organisms from leaving that particular operation and being spread to another or to the auditor's home herd. (20)

Time of year and stage of the production cycle will also have a bearing on biosecurity considerations. Doing an audit in the middle of calving or lambing means visiting when there is a large number of susceptible young animals which have the least immunity to disease. The producer may not want high-risk traffic contacting his most susceptible animals at this time.

On-Farm Food Safety Auditors must be aware of the possible devastating effects of careless hygiene and traffic patterns followed during on-farm visits. (2,3) It is incumbent on auditors to be vigilant of possible disease transfer and to not jeopardize the premises they audit, the credibility of the programs they audit or the supply of safe food products being produced for consumers by these Quality Assurance herds.

BIOSECURITY CONSIDERATIONS FOR ENT RANCE TO AND EXIT FROM PREMISES (8)

(These would be "must-do's)

BEFORE LEAVING THE OFFICE/HOME

- ✓ When setting up the appointment with the owner/manager for the on-farm audit, inquiry will be made as to diseases which may be present and any biosecurity requirements specific to the operation. The auditor will verify which staff members he will meet with and specifically who will be available for the audit. The audit appointment will be made at a convenient time to minimize distractions and adverse effects on production.
- ✓ A potential traffic pattern through the operation will be discussed so as to prevent cross-contamination. The auditor will get a complete list of species present on the farm and be aware that disease transmission can occur across species.
- ✓ The vehicle will be divided into a "clean" area containing fresh supplies and a "dirty" compartment where items will be deposited after being used (see Glossary of Terms). Rubber floormats will be used for the driver and all passengers. Cover the surface of the "dirty" area with heavy plastic that can be removed for cleaning and disinfection.
- ✓ All clean coveralls, boots, audit forms and any other necessary equipment will be kept in plastic containers with lids in the "clean" compartment – one set of supplies for each farm.

UPON ARRIVING AT THE FARM

- ✓ It is adviseable to wear coveralls or a jacket (light nylon shell) and a hat. The coveralls or jacket will be worn over all other clothing making it necessary to only wash the jacket or coveralls after the visit. Outerwear made of nylon or a blend does not hold as much debris, is

easy to wash and dries quickly. Washing outerwear after each visit prevents mechanical transmission of feed, fecal matter or other body secretions to the next location or to the auditor's home herd. Outerwear could be embroidered with a logo for a more professional look. Disposable outerwear may rip more easily exposing and contaminating clothing underneath. If outerwear becomes particularly dirty during an audit it should be changed part way through the audit and particularly dirty clothes should be laundered at a commercial facility rather than contaminate the auditor's home farm.

- ✓ Impermeable rubber boots will be worn. Pay attention to the tread pattern; deep grooves make cleaning more difficult. Clean off as much debris as possible before leaving the farm. It is best to have one pair of boots for each farm visited during the day; this means that boots will be thoroughly cleaned and disinfectant applied with the appropriate contact time at the end of the day to minimize the risk of contamination. Many operations are not set up to sufficiently clean boots (particularly in winter) in order to attain complete disinfection of one single pair of boots for all operations to be audited in one day; the more organic debris present the less effective any disinfectant can be. Plastic disposable overboots will not likely stand up to the terrain being covered in most operations.
- ✓ Some operations will supply boots and coveralls as part of their shower in-shower out biosecurity protocol. This is most common in pork and poultry operations (2,3) – the only draw-back being that "one size" doesn't fit all.
- ✓ Park the vehicle in a clean area near the perimeter of the operation where there is no manure contamination. Roll up windows to prevent entry of insects. It is imperative not to take manure contamination away from the operation on the vehicle when leaving.
- ✓ Put on boots and coveralls AT the farm. Boots will be sanitized with a disinfectant solution before proceeding into the operation.

WHILE ON THE FARM

- ✓ Confirm your traffic pattern through the operation to minimize cross-contamination between production areas. (12) Assess feed storage and processing areas first. Do not stand or walk in feed bunks, over silage piles, bales or through other feedstuffs. View animals and associated handling facilities in order of ascending contamination risk. View animals in order of youngest to oldest and healthiest to sickest. View treatment areas, isolation/sick pens near the end, followed last by dead animal disposal and/or pickup area. (14)
- ✓ Pertinent records can be reviewed at the end of the walk-about; viewing facilities often makes some of the documented procedures self-explanatory. Another option is to acquire records before the visit to better familiarize the auditor with the operation before arrival.

WHEN LEAVING THE FARM

- ✓ Scrape boots free of debris, hose off if possible and wash with a boot brush and disinfectant, remove, place inside a plastic bag and deposit into a plastic container with lid. Coveralls will be removed, turned inside out to contain debris and prevent contaminating street clothing and deposited into the plastic container with the boots.
- ✓ Hands and fingernails will be washed with a suitable skin disinfectant before leaving the operation.
- ✓ Under no circumstances should dirty outerwear/footwear be worn while travelling between premises.

AFTER RETURNING TO THE OFFICE/HOME

- ✓ At the end of the day all items in the "dirty" compartment will be cleaned. All coveralls or outerwear will be laundered regardless of whether or not it looks clean. If particularly dirty consider laundering at a commercial facility to prevent introducing contamination to the

auditor's home herd. Boots will be hosed and brushed free of all organic matter and disinfected with the appropriate solution for an adequate contact time. The "dirty" compartment will be vacuumed or brushed free of debris. After cleaning, boots and outerwear will be returned to the "clean" compartment. All plastic containers will be cleaned inside and out and ensure that there is a sufficient supply of garbage bags. Any plastic carriers, boots or coveralls that are sufficiently damaged that they cannot be properly cleaned will need to be replaced. Clean the exterior of the vehicle paying particular attention to tires and wheel-wells that may be contaminated with manure or other debris.

- ✓ Auditors will shower and wash hair thoroughly each day to remove potential contamination.
- ✓ Auditors will keep a logbook detailing auditing visits and preparatory work. Each entry will include the name, address and phone number of the owner/manager, date of the audit, mileage driven and time spent. A brief outline of the audit findings and any unusual circumstances will be noted. (Any dead animals found in unusual circumstances would warrant close questioning of the producer as to the circumstances of the death and follow-up for a post-mortem report when it becomes available.) Quality Assurance programs centre around record keeping and verifying that accepted procedures are being followed – the auditor's logbook is the auditor's record of accountability. Good Production Practices for auditors centre around preventing disease transfer and thorough cleaning and disinfection of equipment moving between premises. Critical Control Points exist when entering or exiting a different production area on each premises and when moving to a new production unit whether that of a new audit client or the auditor's home herd.

DISINFECTANTS

- ✓ Most pathogens live outside the body for a few hours/days but their lifespan can be greatly extended by the presence of organic material; removal of organic matter can reduce the pathogen load by up to 95%. A disinfectant will be broad spectrum (eliminates bacteria, viruses, protozoa, fungi and spores), non-irritating, non-toxic, non-corrosive, and inexpensive, have good activity in organic matter, appropriate contact time and temperature and effective with a variety of water conditions. (11) The terms disinfectant, antiseptic and detergent are not interchangeable (see Glossary of Terms).
- ✓ Antiseptics suitable for hand washing include Phisohex and Hibitane Skin Cleanser. Gel products that do not require water for washing such as CIDA-Rinse and Microban Skin Cleanser are useful in situations where water is not readily available for washing and the hands are not excessively soiled.
- ✓ Virkon is currently used by CFIA in its on-farm protocols. (15) A 1% solution of Virkon (10 grams of Virkon powder dissolved in 1 litre of lukewarm water) for a contact time of 10 minutes is effective against most common pathogens. Virkon has excellent detergent qualities, is of low toxicity, non-tainting and non-irritating. Cost is approximately $.50/litre. Virkon requires rinsing and goggles and gloves should be worn while mixing the solution.
- ✓ WCVM uses Peroxigard, which is effective at a dilution of 1:16 (2 oz or 64 ml/litre) for a contact time of 5 minutes at 20 degrees C. (15) It is also broad spectrum and has been recently licensed against the anthrax organism in the U.S. There is no need to rinse after use and it effectively breaks down bio-film. Cost is approximately $.52/litre. Protective clothing should be worn during mixing of the solution; a ready to use product is also available.

ORGANIC OPERATIONS

- ✓ Many products routinely used for sanitizing/disinfection are prohibited in organic production. It is imperative the auditor check with the organic producer for specific requirements as there are several organic certifying bodies with differing regulations. Many of the allowed

substances have longer contact times and do not have a broad spectrum of activity making them less effective than traditional disinfectants unless used very carefully. Some of the synthetic substances allowed as disinfectants in organic livestock production are(13):

- Alcohols – Ethanol and Isopropanol – Not effective against non-enveloped viruses such as Rotavirus (scours), not effective in organic matter, require long contact times.
- Chlorine – Calcium Hypochlorite, Chlorine Dioxide, Sodium Hypochlorite (B90). Residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act (3ppm). These are not effective against spores, corrosive, irritating to living tissues, and have much reduced effectiveness in water below 50 degrees Fahrenheit or at a pH outside the range 6-8.
- Iodine – Has poor residual activity necessitating several applications, stains materials, is corrosive and has limited activity in the presence of organic matter.
- Chlorehexidine – Hibitane Skin Cleanser – Requires multiple applications.
- Hydrogen Peroxide – Is not virucidal (does not kill viruses).

✓ When auditing organic operations disinfecting boots with a light spray of alcohol, iodine, or hydrogen peroxide (provided these are allowed substances) will be done on arrival. Hands will be washed with Chlorohexidine or alcohol gel hand sanitizer and all cleaning and disinfection done off the premises. It is imperative that no prohibited disinfectant residues be introduced onto the premises. When cleaning is done prior to arrival on organic premises, after the required contact time with the traditional disinfectant items would be thoroughly rinsed with plain water and allowed to dry before being used on an organic operation.

DISEASES CROSSING SPECIES BARRIERS AND ZOONOSES

Following is a list of the more common diseases that affect multiple species and have major implications in auditing premises where multiple species exist. Some of these diseases cause mild or no apparent infection in one species but can be highly virulent in another species. Some are also zoonotic; auditors should be mindful that personal hygiene is always critical. Auditors must always get a complete listing of species present on premises to be audited and be mindful of all species raised on their home farm while considering the possibility of cross-species disease transfer. This information regarding exposure to other species should be communicated to the auditee. It is possible that some auditors may not be able to audit all species by virtue of species that they raise at home (no one is allowed into a closed pork operation if they have been in contact with other hogs during the last 72 hours). (21,22) Auditors should also be mindful of Hanta virus infection, which they could potentially be exposed to in buildings or areas heavily infested with deer mouse droppings. This infection is potentially fatal in humans. If at any time an auditor experiences any unusual illness they should consult a physician and give their complete exposure history.

DISEASE	SPECIES AFFECTED	SYMPTOMS	CARRIER SPECIES	TRANSMISSION	ZOONOSES
Bovine Virus Diarrhea	Cattle, Bison, Wild Ruminants	Abortion, Congenital Defects, Pneumonia, Diarrhea (Mucosal Disease), Immunosuppression leading to other diseases	Persistently Infected Calves	Manure, Aerosol, Semen	No
Coccidiosis	Cattle, Bison	Bloody Diarrhea	Bison often show no signs	Manure	No
Cryptosporidium	Cattle, Goats, Sheep, Pigs, Bison, Wild Ruminants, Rodents	Diarrhea	All species can be asymptomatic shedders	Manure	Yes
E. coli 0157:H7	Cattle, Sheep, Bison	Ruminants usually show no disease but causes potentially fatal toxemia in humans	Cattle, Sheep, Bison	Manure	Yes
Giardia	Domestic and Wild Species	Diarrhea especially in the young	All, including humans	Manure	Yes
Johne's (6)	Cattle, Bison, Sheep, Elk, Deer	Chronic diarrhea, weight loss	Shed for several months/years before showing disease	Manure, Milk	Implicated in Crohn's Disease
Leptospirosis	Cattle, Bison, Sheep, Goats, Pig, Horse	Kidney infection, abortion, mastitis	All, rodents, wild carnivores	Urine, Aborted Fetus Uterine Discharge	Yes
Listeriosis	Ruminants	Abortion, Mastitis, Encephalitis	All ruminants	Manure, Moldy Silage	Yes
Lungworm	Bison, Cattle	Pneumonia	No inapparent carriers	Manure on pasture	No
Malignant Catarrhal Fever (5)	Cattle, Bison, Elk, Deer, Sheep, Goat	Depression, Diarrhea, Ulcers in Nose and Mouth	Sheep, Goats	Nasal secretions, Placenta and amniotic fluid	No

				of sheep and goats	
Orf (Contagious Ecthyema)	Sheep, Goat, Cattle, Reindeer, Bison	Pustules on mouth, lips, nose, teats, Abortion	No inapparent carriers	Touching pustules, aborted fetus or contaminated equipment	Yes
Parelaphostrongylus Tenuis (Brainworm)	Sheep, Goat, Llama, Elk, Deer, Caribou	Progressive incoordination	Inapparent infection in early stages	Manure	No
Q Fever (9)	Cattle, Sheep, Goats	Often asymptomatic, Sheep may abort	Cattle, Sheep, Goats	Urine, Manure, Milk, Placenta, Fetal Fluids, Survive a long time in environment; often inhaled	Yes
Ringworm	All Farm Animals and Pets	Scabby or scaly skin, hair loss	No inapparent carriers	Direct Contact or contact with fungus contaminated items	Yes
Salmonella	Cattle, Sheep, Swine, Bison, Poultry	Diarrha, Toxemia	All species can be inapparent carriers	Manure	Yes
Sarcosporidia	Cattle, Bison, Sheep, Goat, Pig	Often none	Require carnivore (cat, dog, coyote, fox) as Intermediate Host	Carnivore feces, Raw Meat	Yes
Toxoplasmosis	Cattle, Bison, Pig Sheep,Goat,Horse	Abortion, Stillbirth, Pneumonia	Cats	Cat feces, raw meat	Yes

GLOSSARY OF TERMS

Aerosol Transmission – Disease agents (often viruses) spread through the air.

Antiseptic – Chemical used to inhibit or prevent growth of microbes on living tissue.

Asymptomatic – Showing no symptoms of disease.

"Clean" – Items free of visible dirt, mud or manure that are then disinfected.

Congenital defect – Defect present at birth.

Detergent – Water-soluble cleansing agent that has wetting and emulsifying properties; cationic detergent remains suspended in solution; anionic detergent may not remain suspended in hard water.

"Dirty" – Having been in contact with animal secretions, body fluids or manure.

Disinfectant – Chemical used to inhibit or prevent growth of microbes on inanimate objects; usually too strong to be used on living tissue.

Encephalitis – Inflammation of the brain; usually leads to neurological symptoms.

Immunosuppression – Chemical or disease agents that reduce the ability of the animal's immune system to function properly. (eg. BVD virus in cattle; PRRS virus in swine)

Impermeable – Not permitting the passage of fluids or solids.

Inapparent carriers – Animals carrying and shedding the disease organism without showing symptoms.

Sanitize – To reduce the number of microbes to a safe level.

Sterilize – To eliminate all microbes.

Virulent – A highly infectious and noxious disease process.

Zoonosis – A disease of animals that is communicable to humans.

SAMPLE PAGE FOR AUDITOR'S LOG BOOK

PRE-AUDIT

Contact Date - _____

Farm/Producer Name - _____

Program to be Audited - _____

ALL Species Present - _____

Audit Date & Time - _____

Personnel Present for Audit - _____

Disease Concerns? - _____

Traffic Pattern - _____

AUDIT

Mileage Travelled - _____

Date/Start Time - _____

Farm/Producer Name -

Address - _____

Phone # - _____

Land Location - _____

Disease Concerns? - _____

Changes to Traffic Pattern? _____

List Production Areas _____

_____

Date of Last Audit and Species Audited _____

Was this disclosed to client? _____

Disinfectant Used Upon Entry to Premises _____

List Production Areas in Order Travelled _____

Unusual Findings/Non-Compliance _____

Items Requiring Further Clarification_____

Time Audit Finished_____

Audit Outcome _____

Clean-up Protocol_____

_____
Signature/Date

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Janice Sopatyk, D.V.M.
Box 119
Meacham, Sk. SOK 2VO
306-376-4422